

Chapter 3M. Affected Environment and Environmental Consequences - Cultural Resources

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SUMMARY

This chapter discusses laws and regulations applicable to protection of cultural resources on the DW project islands, presents the results of research of the prehistory and history of the DW project vicinity, and describes cultural resources identified or potentially present on the DW project islands.

Several cultural resource issues are associated with the DW project islands. Bacon Island contains historic-period archaeological sites and architectural properties, most of which represent early 20th century agricultural development and use. Bacon Island resources appear to represent a cohesive record of agricultural development in the Delta and may be eligible for listing in the National Register of Historic Places (NRHP) as a historic district. Webb Tract contains several areas of Piper soils, where prehistoric burials may be present; therefore, the sites may be important to Native Americans. One of the historic sites identified on Bouldin Island appears to be eligible for NRHP listing. Three of the prehistoric archaeological sites identified on Holland Tract may be eligible for NRHP listing and may have importance to Native Americans as prehistoric burial sites; additional archaeological resources may also be present in the Piper soils on the island.

Implementation of the DW project alternatives could result in several significant impacts: demolition of the historic district on Bacon Island and disturbance of prehistoric buried resources that may be present on Webb Tract, the archaeological site on Bouldin Island that may be eligible for NRHP listing, and intact burials and buried prehistoric resources possibly present on Holland Tract. Implementation of Alternative 3 would result in the additional significant impact of damage or destruction of prehistoric resources on Holland Tract as a result of inundation.

Although measures to document and preserve information about the resources are recommended to reduce the impact on the NRHP-eligible district on Bacon Island, this impact would remain significant and unavoidable. Impacts on Webb Tract prehistoric resources and Bouldin Island historic-period resources can be reduced to a less-than-significant level through preparation of a historic properties management plan (HPMP) providing for treatment and monitoring of these resources, and preparation of a data recovery plan for resources on Bouldin Island. Disturbance of intact burials and buried resources on Holland Tract under Alternatives 1 and 2 could be avoided with design of habitat management and enhancement activities to prevent such disturbance and preparation of an HPMP. Mitigation measures are available to recover or protect some of the Holland Tract cultural values that would be lost as a result of implementation of Alternative 3, but this impact would remain significant and unavoidable.

Implementation of the DW project alternatives would result in cumulative impacts on historic-period resources. Destruction of the resources on Bacon Island that may be eligible for NRHP listing as a historic district would add to the loss of this historic resource type in the Delta. This impact is considered significant and unavoidable. Effects of the DW project would not significantly contribute to the overall loss of prehistoric resources in the Delta and are considered to be less than significant.

Under the No-Project Alternative, damage to known and unknown prehistoric sites could result from continued agricultural activities on the DW islands. The adverse effects of continued agricultural activities on historic and prehistoric resources on the DW project islands is typical of the effects of land management in the region. Therefore, implementing the No-Project Alternative would contribute to cumulative effects on cultural resources in the Delta.

AFFECTED ENVIRONMENT

For purposes of the cultural resource analysis of this EIR/EIS, the area of potential effect (APE) for Alternatives 1 and 2 is the entire project site, except the southwest quarter of Holland Tract (Figure 2-1). The APE for Alternative 3 consists of all four islands, including the southwest quarter of Holland Tract. This section describes the results of research of the prehistory and history of the DW project islands and discusses present conditions on the islands. For a more detailed discussion of the prehistory and history of the project area, see Appendix M1, "Cultural Context of the Delta Wetlands Project Islands".

Applicable Laws and Regulations

In addition to meeting CEQA and NEPA requirements, the DW project is required to comply with Section 106 of the NHPA of 1966, as amended, and with its implementing regulations, 36 CFR 800. Section 106 requires that federal agencies take into account the effects of their actions on properties that may be eligible for listing in or that are already listed in the NRHP. The DW project is considered a federal undertaking because of the necessity for a federal permit (Department of the Army permit, issued by the Corps under Section 404 of the Clean Water Act). To determine whether an undertaking could affect properties eligible for NRHP listing, cultural sites (including archaeological, historical, and architectural properties) must first be inventoried and evaluated for eligibility for NRHP listing.

The Section 106 review process is implemented using a five-step procedure: identifying and evaluating historic properties, assessing the effects of the undertaking on properties that are eligible for NRHP listing, consulting with the State Historic Preservation Officer (SHPO) and other agencies for the development of an agreement document that addresses the treatment of historic properties, receiving Advisory Council on Historic Preservation (ACHP) comments on the agreement or results of consultation, and proceeding with the project according to the conditions of the agreement.

Evidence of compliance with the process will be included in the final EIR/EIS. The steps necessary to comply with Section 106 usually are adequate to satisfy the requirements of NEPA and CEQA regarding cultural resources.

Section 7052 of the California Public Health and Safety Code and Section 5097 of the Public Resources Code provide for the protection of Native American remains and identify special procedures to be followed when Native American burials are found. When remains are found, the Native American Heritage Commission (NAHC) and the county coroner must be notified. The NAHC provides guidance concerning the most likely Native American descendants and the treatment of human remains and associated artifacts. Compliance with the provisions of these laws is separate from the requirements of CEQA and NEPA.

Previous Research

Before research was conducted for the DW project, cultural resource investigations in the project area were limited. In 1943, two prehistoric archaeological sites (assigned the numbers CA-CCo-146 and -147 by the California Archaeological Inventory) were recorded in the southwest portion of Holland Tract. CA-CCo-146 was partially excavated by Elsasser in 1954 after burials were uncovered (Elsasser 1954). In the early 1970s, a site believed to be CA-CCo-146 was excavated by the University of California, Davis, after burials were inadvertently discovered by the landowner. In 1985, a small portion of the southern part of Holland Tract was surveyed, but no additional resources were discovered (Hampson 1985).

Previous historic research within the project area was also limited. In the late 1970s, a study of the Delta waterways, which included some resources in the project area, was conducted (Paterson et al. 1978). In 1980, resources in the project area were discussed in an ethnic survey project conducted by the State Office of Historic Preservation (Fujita 1980). This study identified the resources on Bacon Island as being of historic and ethnic importance.

In 1989, cultural resource inventories were initiated for the DW project for compliance with CEQA, NEPA, and NHPA by PAR Environmental Services (PAR) under contract to JSA. PAR conducted archival research and reconnaissance-level field surveys, recorded architectural properties and archaeological resources for all four islands, and made preliminary recommendations regarding the significance of the resources identified (Maniery and Syda 1989).

In 1992, JSA retained PAR to evaluate the historic-period archaeological and architectural resources within the project area for their eligibility for listing in the

NRHP. BioSystems Analysis was requested to evaluate the prehistoric resources for NRHP eligibility. These evaluative studies were completed in 1993. The result of this work will be a determination of eligibility and effect from the SHPO and the development of a programmatic agreement (PA). The finding of eligibility and effect and the draft PA will be included in the final EIR/EIS.

Cultural Context

The following is a summary of the cultural context of the DW project area. This information is extracted from a more complete discussion provided in Appendix M1.

Prehistory

In the Delta, among areas of greatest prehistoric archaeological sensitivity are those where Piper soils are located. Piper soils represent relic sand hills that once stood above the level of the surrounding tule marshes. Because of their elevation above the frequently inundated peat soils, these sand mounds were often used by prehistoric peoples for village and burial sites. Surface evidence of prehistoric sites in this setting is scarce because Piper soils are often covered with peat. Many more sites probably exist on the islands than have been discovered to date.

The earliest recognized use of the Delta region dates from approximately 2500 B.C. to 1000 B.C. and is known as the Early Horizon. Burials from this period have been found in the lower levels of indurated Piper sand mounds.

Middle Horizon sites, dating from approximately 1000 B.C. to A.D. 500, have also been found in the Delta. Sites dating to this period often contain substantial living refuse (midden). Middle Horizon burials are found primarily in flexed positions.

The period between A.D. 500 and the arrival of the Spanish in central California has been named the Late Horizon. This period is characterized by large village sites, increasing evidence of acorn and nut processing, the introduction and use of the bow and arrow, and the use of clam shell disc beads as the primary medium of exchange. During the last part of the period, cremation became a common mortuary practice.

Ethnography

The DW project area is situated at the interface of three different ethnolinguistic groups that used the region before European contact: the Plains Miwok, the Bay Miwok, and the Northern Valley Yokuts. Levy (1978) places Holland Tract within the boundaries of the Plains Miwok; however, settlement and territorial boundaries of the Plains Miwok have long been the subject of controversy in California ethnography. The following summarizes ethnographic information for the three groups.

The tribelet was the largest political unit of the Miwok. The Plains Miwok had about 28 such divisions (Bennyhoff 1977). Within each tribelet were several more or less permanently inhabited settlements and a larger number of seasonal campsites (Levy 1978). The Plains Miwok are thought to have numbered about 11,000; their population density was probably the highest of any group in aboriginal California, averaging over 10 persons per square mile (Baumhoff 1963). The Plains Miwok were subject to missionization in the early part of the nineteenth century, and converts from the westernmost Delta began appearing in baptismal records of Mission San Jose in 1811.

The Bay Miwok were the first of the Eastern Miwok peoples to be missionized, with converts coming from the Saclan tribelet to Mission San Francisco in 1794 (Levy 1978). The Bay Miwok aboriginal population is estimated to have been about 1,700.

The Yokuts had miniature tribes of approximately 300 people, with most of the members of a tribe congregated in one principal settlement with a headman. No precise idea of the size of the aboriginal population of the Northern Yokuts can be arrived at from Spanish accounts; however, two estimates place the total at 25,100 (Cook 1955) and 31,404 (Baumhoff 1963). The native population was not evenly distributed but was clustered in a narrow strip of land bordering the San Joaquin River and its main tributaries (Wallace 1978). The Yokuts were profoundly affected by diseases brought by Euroamericans and by being removed to the missions on the coast.

All three groups occupied large multiple-family villages. The preferred location for settlement was on elevated terraces near streams. Most settlements were inhabited permanently, except during a period of several weeks each year during the fall acorn harvest. Acorns were a staple augmented by various seeds, nuts, roots, berries, and greens. Fishing was very important in both the Miwok and Northern Valley Yokuts economies (Bennyhoff 1977, Levy 1978).

History

Until the Gold Rush of the 1840s and 1850s, the Delta was a network of waterways and natural islands of sand and peat. The Swamp and Overflow Land Act of 1850 opened the Delta for speculation by land developers (Thompson and West 1879). Land ownership of the Delta islands and development of reclamation districts began in the 1850s; however, it was not until the late 1860s that massive efforts were initiated to seriously reclaim the land for farming.

The initiation of reclamation of Bouldin Island in the 1870s brought recognition of the richness of the peat soils and their value for agricultural purposes. Reclamation efforts went hand in hand with extensive construction of ditch systems and pump stations around the islands as a means of draining water, leading to even more acres being planted in crops. Agriculture on Bouldin Island was successful in the 1880s and grew in importance into the 1900s.

The first attempts to commercially grow asparagus were made on Bouldin Island in 1892, and the venture led to the fame of the Delta as the "asparagus capital" of the world. Asparagus, potatoes, beans, and grains were the primary crops grown on the islands before 1900 (Chan 1986). In 1910, farming on the islands focused on potatoes and onions (Sierra Art and Engineering Company 1910).

In the 1880s and early 1890s, most farming was conducted by Chinese laborers. By the late 1890s, Japanese immigrants were steadily arriving in America and joining the Chinese work force. They were aided in their endeavor to find work by George Shima, a fellow immigrant who arrived in America in 1889 and began working as a laborer at a potato farm along the coast (Fujita 1980, Hata and Hata 1986). By 1894, Shima had begun to experiment with potato growing in the Delta on land he leased at Staten Island, and by 1909, Shima was known as the Potato King (Yoshimura 1981).

As early as 1900, Delta farmers devised a series of camps to facilitate cultivation of vast fields on the islands, and Shima's holdings were no exception. The camps functioned as autonomous units. Each had its own housing, cooking facilities, barn, sheds, horses, and farm implements. In addition, large warehouses used for packing, storing, and processing crops were located on tops of levees near the landing or wharf (Chan 1986, Paterson et al. 1978).

By 1917, Shima had 17 camps on Webb Tract, 12 on Holland Tract, and 12 on Bacon Island, as well as

headquarters on Webb Tract and Bacon Island (Widdows 1917). Shima operated the camps under a lease with the California Delta Farms Company, of which he was a shareholder. In addition, Shima maintained a residence at camp no. 1 on Bacon Island, and his headquarters office for the Delta was located in camp no. 3 on Bacon Island (Fujita 1980). Following completion of reclamation of Bouldin Island in 1918, 37 camps were also built around the perimeter of that island (Budd and Widdows 1926).

Today, Bacon Island, Bouldin Island, and Webb Tract are still used primarily for agriculture. Portions of Holland and Webb Tracts and Bouldin Island are used for grazing sheep and cattle, and there are hunting clubs and two marinas on Holland Tract.

Research Methods

The inventory phase of the cultural resources investigation consisted of archival research, field surveys, site recordation, and preliminary assessments of resource significance.

Prefield research was conducted at the following repositories:

- the Northwest Information Center at Sonoma State University and the Central Information Center at California State University, Stanislaus;
- the State Office of Historic Preservation;
- the NAHC;
- California State Library; and
- Reclamation's Sacramento office.

Census materials, maps, and written histories were checked to identify landing sites, agricultural operations and camps, and other activity sites on the islands. County offices were also contacted for information they might have on cultural resources in the project area. In addition, several Japanese American organizations, including the National Japanese American Historical Society, Japanese American Historical Museum, Japanese American Citizens League, and Haggin Pioneer Museum were contacted for information.

Following the archival research, a reconnaissance-level field survey of the project area was conducted. In

consultation with the lead state and federal agencies, a sampling strategy was developed for the inventory. Areas believed to have little potential for archaeological resources because they would have been seasonally inundated were subjected to a 20% sample survey. Areas with high potential for prehistoric archaeological materials, such as the Piper sand mounds, were subjected to a 100% survey. Areas identified during archival research as having potential for historic or prehistoric remains were also surveyed completely.

Areas to be sample surveyed were selected to provide representative coverage of the entire project area. Researchers walked transects 20-30 meters apart (20 meters on Piper soils) across each of the areas selected for survey. Approximately 100 acres of Piper sand mounds on Holland Tract could not be surveyed because they are not owned by or under control of DW.

An architectural survey was also conducted by PAR. This work included identifying and recording all potentially historic structures on the four islands. For each structure built before 1946, the structure was photographed and numbered, its physical location was mapped, and a California Historic Site Inventory form was completed. Because many of the structures had the potential for archaeological deposits, California Archaeological Inventory forms were also completed for some of these resources.

Following the inventory, PAR conducted significance evaluations, including archival and oral history research and archaeological test excavations of the historic-period resources. BioSystems Analysis conducted test excavations and evaluated the significance of prehistoric resources. Determination of eligibility and effect reports were prepared and have been submitted to the SHPO for concurrence. Documentation of this consultation will be included in the final EIR/EIS.

Inventory Findings

The archival research and field surveys of the DW project islands revealed the presence of many cultural resources. The following section summarizes PAR's report (Maniery and Syda 1989) and describes the resources identified and recorded on the four islands. The following discussion does not include descriptions of isolated artifacts and features. For a complete listing of resources identified on each island, see Tables M2-1 through M2-4 in Appendix M2, "Cultural Resource Survey Information for the Delta Wetlands Project Islands".

Resources with archaeological deposits or the potential for archaeological deposits were assigned trinomials by the California Archaeological Inventory. Locations where only architectural remains were found are identified with numbers assigned during the survey. Enumeration of isolated artifacts varies for different Information Centers of the California Archaeological Inventory. Isolated artifacts found on Bacon and Bouldin Islands were assigned isolated artifact numbers by the Central California Information Center. These resources are denoted with an "I" in Tables M2-3 and M2-4 in Appendix M2. Isolated artifacts are not numbered by the Northwest Information Center, so the numbers assigned during the survey are used.

Bacon Island

Resources on Bacon Island consist of historic-period archaeological sites and architectural properties; no records or evidence of prehistoric sites have been found. The resources identified on Bacon Island are listed in Table M2-1 in Appendix M2.

Most of the historic resources on Bacon Island are related to agricultural development and use. Bacon Island once had 12 main work camps, at least two auxiliary camps, a headquarters, and associated landings all built by George Shima between 1915 and 1918. Standing historic structures were identified at 10 of the main work camps, one of the auxiliary camps, and the bridge tender's residence. Identified buildings included bunk, boarding, and foremen's houses; kitchens; sheds; wash houses; lavatory facilities; offices; and barns. The majority of the structures are of Craftsman design, characterized by steep- or low-pitched, end- and side-gabled roofs, exposed rafters, porches supported by square columns, multipane or single-pane windows, and paneled doors.

The remains of the 1870-1910 site of Day's Landing is also present on the island. This site is also the location of Shima's labor camp no. 5.

Webb Tract

Five of the seven resources identified on Webb Tract are isolated historic-period features or artifacts. Two resources are architectural/archaeological sites. No prehistoric resources have been found on the tract. Table M2-2 in Appendix M2 lists the resources on Webb Tract.

Site number CA-CCo-584H on Webb Tract consists of a large one-story, Craftsman-style house with a low-

pitched and gabled roof, exposed rafters, and multipane windows. The site is located on top of a sand mound, and a historic artifact scatter is associated with the structure. CA-CCo-584H marks the location of camp no. 1. A second Craftsman-style structure (CA-CCo-583H), built about 1915, is located at the ferry terminus of the Jersey-Bradford-Webb ferry and is used by the ferry operator.

The remaining resources on Webb Tract include two isolated cement pads and three locations with isolated fragments of glass or ceramic material. The remaining labor camps have been bulldozed or dismantled and no longer exist.

Although no prehistoric resources have been identified, Webb Tract contains several areas of Piper sandy loam soils. These high-sensitivity areas for prehistoric resources were examined in detail during the field survey, and no surface evidence of prehistoric resources was found. However, burials have reportedly been removed from Piper sand mounds on the tract (Maniery pers. comm.). Subsurface sampling or testing is not practicable, given the acreage (approximately 330 acres of Piper sand) involved.

Bouldin Island

Thirteen historic-period resources were identified on Bouldin Island, consisting of five historic sites and eight isolated features or artifacts, representing two landings, six camps, and a pumping station. No records or evidence of prehistoric sites have been found on the island. Table M2-3 in Appendix M2 lists the resources identified on Bouldin Island.

The five archaeological sites include CA-SJo-205H and -207H, which are trash scatters with 1920-era artifacts located in plowed fields. These two sites have been severely damaged by plowing activities, and the precise location of their origin could not be ascertained. Site CA-SJo-206H is an intact trash deposit near the location of historic labor camp no. 25. Site CA-SJo-208H is the historic location of Schultz Landing, dated to about 1873, and was also used by Shima as labor camp no. 1 during the 1920s. Structural foundations and historic artifacts were found at this location.

CA-SJo-209H is still used by the Bouldin Farming Company and is the site of the 1920s camp No. 21. Two Craftsman-style boarding houses with exposed rafters, pitched and gabled roofs, louvers, recessed porches, and paneled doors are situated on the top and sides of the levees. Bulldozed foundation slabs and modern structures are also present at the site.

Some historic locations on the island are represented by an isolated concrete foundation with no associated historic material. Others have been virtually destroyed through agricultural use.

Holland Tract

Prehistoric Resources. Four prehistoric archaeological sites and three isolated artifacts have been identified on Holland Tract (Table M2-4 in Appendix M2). Two of the resources (CA-CCo-146 and -147) were recorded previously. CA-CCo-146 was recorded in the southwest corner of the island, and CA-CCo-147 was recorded about 1,000 feet north. Both sites were located on Piper sand mounds. Although CA-CCo-147 was reportedly destroyed (Cook and Elsasser 1956), PAR relocated and rerecorded the site during its survey. Cultural materials noted during the field survey included animal and human bone fragments; shell, obsidian, and chert flakes; and stone implements. Local landowners reported that approximately 70% of the site was washed away during the 1980 flood, although sand extraction is also said to have contributed to the mound's reduced size.

Some confusion exists about the location and condition of CA-CCo-146. CA-CCo-146 was excavated in 1954 by Elsasser after a landowner reported finding burials (Elsasser 1954, Hampson 1985). Elsasser removed four burials from the site, including an infant buried with many ceremonial artifacts. A report prepared by Cook and Elsasser (1956) indicated that following the 1954 excavation, a farmer leveled the mound for agricultural use. The area where CA-CCo-146 was plotted was surveyed by PAR, but no cultural materials were identified at that location.

Subsequent to PAR's survey, earthmoving work conducted by reclamation district personnel uncovered disarticulated human remains and a single artifact east of the recorded locations for both CA-CCo-146 and -147. PAR staff examined the find and supervised its reburial. No midden or other cultural material was observed at the location. Because it was not determined whether the materials represented an archaeological site, this resource was not recorded and was subsequently referred to as the "unrecorded resource".

Information obtained recently from the University of California, Davis, supports the theory that CA-CCo-146 was misplotted originally and that the unrecorded resource is actually the remnants of CA-CCo-146 (Bio-Systems Analysis 1993). This site was excavated by the University of California, Davis, in 1973 after burials were uncovered by the landowner. Several burials were

excavated and are curated at the University of California, Davis. Given the uncertainty regarding the location of CA-CCo-146, a new trinomial (CA-CCo-678) was assigned to this location.

In addition to the previously recorded sites, PAR identified and recorded two new sites (CA-CCo-593 and -594). CA-CCo-593 is a prehistoric occupation site on a Piper sand mound near the center of the tract. The top of the mound was plowed in the past, exposing burned and unburned human remains. During PAR's examination, shell beads, chipped and ground stone tool implements, obsidian and chert flakes, animal bone fragments, disarticulated human remains, and charcoal were noted on the surface of the site.

CA-CCo-594, situated in the north-central portion of Holland Tract, consists of the remaining portion (approximately 5%) of a Piper sand mound. Most of the site was removed while the mound was being excavated for use in levee reconstruction and repair work. A few pieces of chipped stone, a bone fragment, and one stone implement were found in this location.

In 1989, following the inventory, CA-CCo-147 and CA-CCo-593 were damaged by unauthorized excavations by a Native American determined by the NAHC to be the most likely descendant. These excavations were reportedly conducted to locate human remains.

Additional archaeological resources that were not identified during the survey may be present on Holland Tract. Buried deposits and human remains have been found in Piper sands on Holland Tract and other islands. In many cases, no cultural materials are found above these deposits and burials, making their discovery problematic. Subsurface sampling or testing is not practicable, given the acreage (approximately 220 acres of Piper sand) involved.

In addition, approximately 100 acres of Piper sand mounds on the southwest portion of the island could not be surveyed because DW does not own or control this parcel, and access was not granted to conduct surveys. Undiscovered resources may be present on this parcel.

Historic-Period Resources. Of the 12 work camps on Holland Tract in 1917, only the remnants of two (CA-CCo-585H and -586H) remain (Table M2-4). CA-CCo-585H consists of Craftsman-style buildings among modern structures. These structures are used seasonally as a duck hunting club. CA-CCo-586H marks the 1917 location of camp no. 5. Other sites have been bulldozed and destroyed. The 1980 flood reportedly damaged many of the historic structures on the perimeter of the island,

leading to their demolition (Hampson 1985). Concrete pads and pier blocks are all that remain at these locations.

Determination of Resource Significance

There are three sets of criteria for assessing cultural resource significance: NRHP eligibility criteria, CEQA significance criteria, and NEPA significance criteria. Following is the definition of the NRHP criteria for eligibility:

The quality of significance in American history, architecture, archaeology, and culture is present in districts, sites, buildings, structures, and objects of state and local importance that possess integrity of location, design, setting, materials, workmanship, feeling and association, and that:

- are associated with events that have made a contribution to the broad pattern of our history;
- are associated with the lives of people significant in our past;
- embody the distinct characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
- have yielded, or are likely to yield, information important in prehistory or history (36 CFR 60.6).

Under CEQA, important cultural resources are described as:

- being associated with an event or person of recognized significance in California or American history, or recognized scientific importance in prehistory;
- providing information which is both of demonstrable public interest and useful in addressing scientifically consequential and reasonable or archaeological research questions;

- having a special or particular quality such as oldest, best example, largest, or last surviving example;
- at least 100 years old and possesses substantial stratigraphic integrity; or
- being able to address important research questions that historical research has shown can be answered only with archaeological methods (State CEQA Guidelines Appendix K).

Determination of resource significance for NEPA includes resources considered significant by:

- inclusion in the records of recognized organizations, such as the NRHP, National Historic Landmarks, Points of Historical Interest, Native American Heritage Commission sacred lands files, and city and county registers;
- public groups, such as Native American groups and historical societies; and
- technical and professional groups and individuals.

Section 106 of the NHPA, NEPA, and CEQA require consideration of effects of projects on traditional cultural values. Resources with contemporary or sacred values to Native Americans are considered significant. Because this project also requires compliance with Section 106 of the NHPA, the impact assessment uses the NRHP significance criteria to assess project effects.

Bacon Island

PAR's 1989 research and inventory found that the resources on Bacon Island represent a cohesive record of agricultural development in the Delta. For this reason, PAR suggested that Bacon Island was potentially eligible for NRHP listing as a district under 36 CFR 60.4 criteria of (a) historic events, (b) significant people, (c) architecturally distinctive structures, and (d) important sources of information.

PAR's study further recommended that additional work be conducted to determine the boundaries, contributing elements, and period of significance of the potential historic district. In 1992, PAR conducted the additional archival and oral history research and prepared a determination of NRHP eligibility for the Bacon Island

historic district. The following is extracted from PAR's report (PAR 1993a).

Ten labor camps on the island and one bridge tender's residence remain on Bacon Island. A total of 105 buildings were associated with the camps. In addition to the buildings, two pump houses, siphons, canals, agricultural fields, and a modern farming headquarters are present. Five of the camps appear to have archaeological elements, and two other archaeological sites exist on the island.

Given the general theme of the island (agriculture), the condition of the existing camps, and the water conveyance and pumping system, PAR recommended that the resources on Bacon Island meet the NRHP's definition of district. The cultural landscape, water system, camp architecture and layout, and pump house locations are all integral parts of the operation of Bacon Island. The association of the island and the camps with Japanese farmworkers and other ethnic groups qualifies the district as being eligible for listing in the NRHP under Criterion A. The involvement of George Shima in island reclamation, camp construction, and ongoing farming operations qualifies the district as being eligible for listing in the NRHP under Criterion B.

Bacon Island resources are an intact example of architectural styles (vernacular Craftsman) and camp layout once found throughout the Delta, making the district eligible for listing in the NRHP under Criterion C. Finally, seven known archaeological sites are present on the island, and these sites contain material that is important to ongoing research on Japanese-American culture. Therefore, the district meets NRHP eligibility Criterion D.

Webb Tract

Six of the seven resources recorded on Webb Tract are not potentially eligible for NRHP listing because of their lack of research potential, isolated nature, or common occurrence throughout the Delta region (Maniery and Syda 1989). PAR suggested that CA-CCo-584H was potentially eligible for NRHP listing and recommended that further work be conducted to determine the extent and integrity of the subsurface deposits and the site's research potential.

In 1992, PAR conducted a test excavation at CA-CCo-584H and determined that most of the artifacts dated to circa 1950s to 1970s. Some older materials were located but only in disturbed contexts. This site does not

appear to meet the criteria for NRHP eligibility (PAR 1993b).

Bouldin Island

In 1989, PAR suggested that CA-SJo-206H and CA-SJo-208H were potentially eligible for listing in the NRHP and that further investigations of the subsurface integrity and research potential of the resources be conducted. In 1992, PAR conducted test excavations at the two sites to determine whether they were eligible for listing in the NRHP. Few artifacts were found at CA-SJo-206H and most dated to post-1940. Given the paucity of the remains and their recent age, the site does not appear to meet the criteria for NRHP eligibility (PAR 1993b).

CA-SJo-208H contained two intact refuse features with 1920s bottles, ceramics, and metal. PAR suggested that materials from this site have the potential to address research questions, and that the site is thus eligible for listing in the NRHP under Criterion D (PAR 1993b).

Holland Tract

PAR suggested that CA-CCo-147, -593, and -594 are potentially eligible for NRHP listing under Criterion D because of their potential to yield information important in reconstructing prehistoric lifeways and economic exchange patterns and in answering questions concerning the development of prehistoric culture in the Delta. The standing structures on the tract are not unique in the Delta region and are not considered potentially eligible for NRHP listing. Other resources on the island consist of isolated prehistoric artifacts or historic cement foundations and are not eligible for NRHP listing.

Subsequent to the completion of PAR's report, human remains and cultural materials believed to mark the location of CA-CCo-146 were identified. Because of consultation with lead state and federal agencies regarding which sites required further evaluative studies, this site was added to those recommended by PAR for additional work. At that time, it was decided that no further work was necessary at CA-CCo-594 because too little of the site remained for it to be eligible for NRHP listing.

In 1992, BioSystems Analysis conducted test excavations at CA-CCo-147, CA-CCo-593, and CA-CCo-678. BioSystems Analysis determined that CA-CCo-147 contained intact subsurface deposits and intact burials. BioSystems Analysis has concurred that CA-CCo-147 is eligible for listing in the NRHP and is also important

because of the values that Native Americans place on burials (BioSystems Analysis 1993).

CA-CCo-593 consisted of a shallow disturbed deposit with few artifacts and disarticulated human remains. This site does not appear to be eligible for listing in the NRHP under Criterion D for its archaeological value. However, the site may contain intact burials with importance to Native Americans.

CA-CCo-678 does not contain intact archaeological deposits and does not appear to meet NRHP eligibility Criterion D for its archaeological value. However, intact human remains that have importance to Native Americans have been found at this site.

In addition to the known sites on Holland Tract, additional buried resources on the 100-acre parcel that were not surveyed may exist. Given the scarcity of these types of resources and the fact that they often contain burials, these resources are likely to be significant.

IMPACT ASSESSMENT METHODOLOGY

Analytical Approach and Impact Mechanisms

Impacts could result from the following elements of the DW project alternatives:

- neglect of historic properties, resulting in their deterioration or destruction;
- demolition of buildings or structures;
- placement of fill for levee construction and periodic replenishment and other components of construction (e.g., sand borrowing and construction of siphons and pumps) that affect historic properties;
- flooding of islands for water storage resulting in the wet/dry cycling and saturation of cultural materials and human remains;
- wave erosion of the archaeological sites during flooded periods;
- ground disturbance related to habitat management or enhancement activities that could disturb historic properties; and

- presence of hunters and others increasing the potential for vandalism of archaeological sites on the islands.

Criteria for Determining Impact Significance

Section 106 of the NHPA, NEPA, and CEQA describe the criteria for impact assessment for cultural resources. Under Section 106, three possible findings of effect can be made: no effect, no adverse effect, and adverse effect. ACHP regulations define an undertaking as having an effect on historic property when the undertaking:

may alter the characteristics of the property that may qualify the property for inclusion in the NRHP, including alteration of the property's location, setting, or use. An undertaking may have an adverse effect when the effect on a historic property may diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association. Adverse effects on historic properties include, but are not limited to:

- physical destruction or alteration of all or part of the property;
- isolation of the property from or alteration of the property's setting when that character contributes to the property's qualification for the NRHP;
- introduction of visual, audible, or atmospheric elements that are out of character with the property or alter its setting;
- neglect of a property resulting in its deterioration or destruction; and
- transfer, lease, or sale of the property (36 CFR 800.9).

Note that these are the ways in which adverse effects can occur; not all these elements would result from implementation of the DW project alternatives.

Under CEQA, an impact is considered significant if the project may cause damage to an important cultural resource.

Impacts would be significant under NEPA if a project would diminish the integrity of a resource's location, design, setting, materials, workmanship, feeling, or association or cause the loss or destruction of significant scientific, cultural, or historical resources (40 CFR 1508.27).

Section 106 of the NHPA, NEPA, and CEQA require consideration of effects of projects on traditional cultural values. Significant impacts would occur if areas with contemporary or sacred values to Native Americans would be adversely affected by the project.

An impact would be considered beneficial if it would result in the protection, stabilization, or restoration of cultural properties listed or eligible for listing in the NRHP or sites determined to be important under CEQA.

Less-than-significant impacts would occur if sites determined ineligible for listing in the NRHP or sites not considered important under CEQA were affected by the project.

IMPACTS AND MITIGATION MEASURES OF ALTERNATIVE 1

Alternative 1 involves storage of water on Bacon Island and Webb Tract (reservoir islands) and management of Bouldin Island and Holland Tract (habitat islands) primarily as wildlife habitat.

This section describes the impacts of Alternative 1 on cultural resources and outlines mitigation measures that may avoid, minimize, rectify, reduce, or compensate for the predicted impacts. Determination of which mitigation measures will be required will be made by the lead state and federal agencies in consultation with the SHPO as part of the determination and eligibility and effect process, as required by Section 106 of the NHPA. The NAHC and appropriate Native American groups will have been consulted. Implementation of the selected mitigation measures will be ensured through the development and execution of a PA. Signatories to the PA will be DW, the Corps, SWRCB, the SHPO, and ACHP. The PA will require that an HPMP be prepared to outline the specific mitigation for each site affected by the project.

Prehistoric Resources

Bacon Island

No NRHP-eligible prehistoric resources are present on Bacon Island. Therefore, no impacts are anticipated.

Webb Tract

No NRHP-eligible prehistoric resources have been identified on Webb Tract; however, 335 acres of Piper sands that could contain buried resources are present on the tract. In addition, burials have reportedly been uncovered on Webb Tract in the past.

Bouldin Island

No NRHP-eligible prehistoric resources are present on Bouldin Island. Therefore, no impacts are anticipated.

Holland Tract

CA-CCo-593, a prehistoric archaeological site, is within the APE for Alternative 1. The site consists of a shallow disturbed deposit with few artifacts and disarticulated human remains. This site does not appear to be eligible for listing in the NRHP under Criterion D for its archaeological value. Although no intact burials were found at CA-CCo-593, their presence cannot be ruled out, given the amount of disarticulated skeletal materials observed during the survey and test excavation. If intact human remains are present at the site, they may have importance to Native Americans. In addition, Piper sands on Holland Tract could contain buried resources.

Summary of Project Impacts and Recommended Mitigation Measures

Impact M-1: Disturbance of Buried Resources (If Present) in the Archaeologically Sensitive Piper Sands on Webb Tract. Because the value of archaeological resources often depends on their integrity, project activities that disturb buried resources could render them insignificant. If significant buried resources are present on Webb Tract and they are disturbed by implementation of the alternative, such disturbance would be considered a significant impact. Implementing Mitigation Measure M-1 would reduce Impact M-1 to a less-than-significant level.

Mitigation Measure M-1: Prepare an HPMP to Provide for the Long-Term Monitoring and Treatment of Archaeologically Sensitive Areas on Webb Tract. Prior to implementation of Alternative 1, the project applicant shall prepare an HPMP that will specify notification procedures in the event of discovery of cultural materials or human remains in the archaeologically sensitive Piper sand deposits. The HPMP will include a monitoring plan to address impacts resulting from inadvertent discovery of cultural resources and human remains, and will outline treatment and management requirements for these resources. Treatment of archaeological resources usually consists of data recovery excavations designed to retrieve important information that would be lost as a result of project implementation. If human remains are identified, consultation with the NAHC will be required for development of appropriate mitigation measures.

Impact M-2: Disturbance of Intact Burials at CA-CCo-593 (If Present) on Holland Tract. Ground-disturbing activities, such as plowing and planting, associated with habitat management or enhancement could uncover previously undiscovered burials at CA-CCo-593. Disturbance of intact burials would be considered a significant impact. Implementing Mitigation Measure M-2 would reduce Impact M-2 to a less-than-significant level.

Mitigation Measure M-2: Design Habitat Management and Enhancement Activities to Prevent Disturbance of CA-CCo-593 on Holland Tract. Prior to implementation of Alternative 1, the project applicant shall prepare an HPMP that considers the possibility that intact human remains exist at CA-CCo-593. The HPMP will specify that no deep plowing (more than 18 inches deep) or planting of invasive vegetation will be permitted on the site. Currently, the HMP calls for the area to be planted in herbaceous grasses (see Appendix H3, "Habitat Management Plan for the Delta Wetlands Habitat Islands").

Impact M-3: Disturbance of Intact Burials in CA-CCo-593 (If Present) Resulting from Vandalism on Holland Tract. Implementation of Alternative 1 could result in disturbance of intact burials, if they are present at CA-CCo-593, as a result of increased visitation and the potential for pot hunting and vandalism. Disturbance of intact burials would be considered a significant impact. Implementing Mitigation Measure M-3 would reduce Impact M-3 to a less-than-significant level.

Mitigation Measure M-3: Prepare an HPMP to Address Disturbance of Human Remains at CA-CCo-593 on Holland Tract. Prior to project implementation, the project applicant shall prepare an

HPMP that specifies the notification procedures that will be followed if intact human remains are discovered at CA-CCo-593. The HPMP will include a monitoring plan to address impacts resulting from inadvertent discovery of human remains, pot hunting, and vandalism and will outline treatment and management requirements for human remains should they be discovered. Consultation with the NAHC will also be outlined in the HPMP. Treatment could include measures such as ceasing ground-disturbing activities on the site, fencing the site to prevent access, and increasing monitoring of the site. If the burials cannot be protected, treatment could include removing them from the site and reburying them elsewhere.

Impact M-4: Disturbance of Buried Resources (If Present) in the Archaeologically Sensitive Piper Sands on Holland Tract. Piper sands on Holland Tract could contain buried resources. Ground-disturbing activities, such as plowing and planting associated with habitat management or enhancement, could uncover previously undiscovered resources on Holland Tract. Because the value of archaeological resources often depends on their integrity, project activities that disturb buried resources could render them insignificant. If significant buried resources are present and they are disturbed by implementation of Alternative 1, such disturbance would be considered a significant impact. Implementing Mitigation Measure M-4 would reduce Impact M-4 to a less-than-significant level.

Mitigation Measure M-4: Prepare an HPMP to Provide for the Long-Term Monitoring and Treatment of Archaeologically Sensitive Areas on Holland Tract. Prior to project implementation, the project applicant shall prepare an HPMP that will specify notification procedures in the event of discovery of cultural materials or human remains in the archaeologically sensitive Piper sand deposits. The HPMP will include a monitoring plan to address impacts resulting from inadvertent discovery of cultural resources and human remains and will outline treatment and management requirements for these resources. Treatment of archaeological resources usually consists of data recovery excavations designed to retrieve important information that would be lost as a result of project implementation. If human remains are identified, consultation with the NAHC will be required for development of appropriate mitigation measures.

Historic-Period Resources

Bacon Island

PAR has suggested that resources on Bacon Island constitute a historic district eligible for NRHP listing. Findings indicate that 10 labor camps and one bridge tender's residence, totaling 106 buildings, are contributing elements to the district. In addition, there are two pump houses, siphons, canals, agricultural fields, and a modern farming headquarters on Bacon Island. Five of the camps appear to have archaeological elements, and two other archaeological sites on the island that are not associated with labor camps exist.

Because properties on Bacon Island appear to be eligible for NRHP listing as a historic district, the effect of implementation of Alternative 1 on the district as a whole must be assessed. The definition of an NRHP district implicitly recognizes that the importance of the whole is greater than the sum of its contributing parts. By definition, the loss of a single contributing element within an NRHP district has a deleterious effect on the integrity and research potential of the remaining contributing elements and on the district as a whole. If a project component affects one contributing element of the district, it affects the entire district.

The majority of resources on Bacon Island eligible for NRHP listing will be affected by reconstruction of the levees and inundation. Most of the structures lie on the perimeters of the islands in areas that would be disturbed by reconstruction of levees. Structures on the sides or near the bases of levees would be subject to significant impacts resulting from fill placement.

Webb Tract

No historic-period resources eligible for NRHP listing are present on Webb Tract. Therefore, no impacts are anticipated.

Bouldin Island

PAR suggested that one historic archaeological site (CA-SJo-208H) on Bouldin Island was eligible for listing in the NRHP under Criterion D.

Holland Tract

No historic-period resources eligible for NRHP listing are present on Holland Tract. Therefore, no impacts are anticipated.

Summary of Project Impacts and Recommended Mitigation Measures

Impact M-5: Demolition of the NRHP-Eligible Historic District on Bacon Island. Although a small number of buildings may be preserved, most of the district eligible for NRHP listing will be demolished and inundated. This impact is considered significant and unavoidable. Mitigation measures can be implemented to recover some of the historical values that would be lost as a result of Alternative 1 implementation. Implementing Mitigation Measures M-5 through M-8 would reduce Impact M-5, but not to a less-than-significant level.

Mitigation Measure M-5: Prepare an HPMP and a Data Recovery Plan for Archaeological Deposits on Bacon Island. Prior to project implementation, the project applicant shall prepare an HPMP that will outline how significant archaeological materials should be treated. The HPMP will require preparation of a data recovery plan that specifies how important archaeological data will be recovered.

Mitigation Measure M-6: Prepare a Videotape of Public Broadcasting System Quality of the NRHP-Eligible Historic District on Bacon Island. Prior to project implementation, the project applicant shall prepare a video that captures some of the qualities that make the historic district significant. This production should be prepared to meet the technical requirements for airing on the Public Broadcasting System (PBS), as specified in the PBS producers' handbook. To meet PBS requirements, the video must be at least 27 minutes long.

Mitigation Measure M-7: Prepare a Popular Publication on Bacon Island Resources for Use by Museums, Cultural Centers, and Schools. Prior to project implementation, the project applicant shall produce a popular publication to disseminate historical information on the NRHP-eligible historic district on Bacon Island to the public. This document should combine historical photographs with information gathered from historical research and interviews to describe the history of Bacon Island. The publication should be prepared for use by schools, historical societies, local museums, and the general public.

Mitigation Measure M-8: Complete Historic American Building Survey/Historic American Engineering Record Forms, Including Photographic Documentation, That Preserve Information about the NRHP-Eligible District on Bacon Island. Prior to project implementation, the project applicant shall complete architectural and engineering documentation for contributing elements in the NRHP-eligible historic district, consisting of measured drawings, photographs, and written data. These are used to preserve information about a historic building, site, structure, or object that may be demolished or subject to loss of historical integrity. Documentation may be included in the Historic American Building Survey and the Historic American Engineering Record Collections in the Library of Congress.

Impact M-6: Disturbance of Archaeological Site CA-SJo-208H on Bouldin Island. Archaeological site CA-SJo-208H could be affected by activities related to implementation of Alternative 1. Because the value of archaeological resources often depends on their integrity, project activities that disturb significant buried resources could render them insignificant. This impact is considered significant. Implementing Mitigation Measure M-9 would reduce Impact M-6 to a less-than-significant level.

Mitigation Measure M-9: Prepare an HPMP and a Data Recovery Plan for Archaeological Deposits on Bouldin Island. Prior to project implementation, the project applicant shall prepare an HPMP that will outline how significant archaeological materials should be treated. The HPMP will require that a data recovery plan be prepared that specifies how important archaeological data will be recovered.

IMPACTS AND MITIGATION MEASURES OF ALTERNATIVE 2

The impacts and mitigation measures of this alternative are the same as those of Alternative 1.

IMPACTS AND MITIGATION MEASURES OF ALTERNATIVE 3

Alternative 3 involves storage of water on Bacon Island, Webb Tract, Bouldin Island, and Holland Tract, with secondary uses for wildlife habitat and recreation.

This section describes the impacts of Alternative 3 on cultural resources and outlines mitigation measures that may avoid, minimize, rectify, reduce, or compensate for the predicted impacts. Determination of which mitigation measures will be required will be made by the lead state and federal agencies in consultation with the SHPO as part of the determination of eligibility and effect process, as required by Section 106 of the NHPA. The NAHC and appropriate Native American groups will have been consulted. Implementation of the selected mitigation measures will be ensured through the development and execution of a PA. A single PA covering all historic properties on the four islands that will be affected by the project will be prepared. Signatories to the PA will be DW, the Corps, SWRCB, the SHPO, and ACHP. The PA will require that an HPMP be prepared to outline the specific mitigation for each site affected by the project.

Prehistoric Resources

Bacon Island

As described above under "Impacts and Mitigation Measures of Alternative 1", no prehistoric resources eligible for NRHP listing exist on Bacon Island; therefore, no impacts are anticipated.

Webb Tract

The effect of implementation of Alternative 3 on prehistoric resources on Webb Tract would be identical to that described above under "Impacts and Mitigation Measures of Alternative 1".

Bouldin Island

As described above under "Impacts and Mitigation Measures of Alternative 1", no prehistoric resources eligible for NRHP listing exist on Bacon Island; therefore, no impacts are anticipated.

Holland Tract

Three prehistoric archaeological sites (CA-CCo-147, CA-CCo-593, and CA-CCo-678) on Holland Tract are eligible for NRHP listing under Criterion D or have other values that make them significant. CA-CCo-147 and CA-CCo-678 contain intact human remains. No intact burials were found at CA-CCo-593; however, their

presence cannot be ruled out, given the amount of disarticulated skeletal materials observed during the survey and test excavation.

Of the three sites, only CA-CCo-147 appears to retain a substantial archaeological deposit. CA-CCo-593 is shallow and disturbed. If CA-CCo-678 had a cultural deposit, most of it was removed during leveling of the mound. Piper sands on Holland Tract could contain buried resources. If buried resources are present, activities associated with implementation of Alternative 3 would result in significant impacts.

Approximately 100 acres of Piper sand mounds have not been surveyed because they are not owned or under the control of the project applicant, and the current owner did not permit the area to be surveyed. Additional significant resources could be present on this parcel.

These resources could be affected by several different mechanisms, including flooding of islands for water storage, resulting in wet/dry cycling and saturation of cultural materials and human remains; wave erosion of archaeological deposits during flooded periods; and presence of hunters and others, increasing the potential for vandalism on the islands.

Summary of Project Impacts and Recommended Mitigation Measures

Impact M-7: Disturbance of Buried Resources (If Present) in the Archaeologically Sensitive Piper Sands on Webb Tract. This impact is described above under Impact M-1. This impact is considered significant. Implementing Mitigation Measure M-1 would reduce Impact M-7 to a less-than-significant level.

Mitigation Measure M-1: Prepare an HPMP to Provide for the Long-Term Monitoring and Treatment of Archaeologically Sensitive Areas on Webb Tract. This mitigation measure is described above under "Impacts and Mitigation Measures of Alternative 1".

Impact M-8: Damage or Destruction of Known Archaeological Sites Resulting from Inundation, Wave Action and Erosion, or Vandalism on Holland Tract. Sites on Holland Tract could be affected by implementation of Alternative 3 because of inundation, wave action and erosion, or vandalism. These sites contain significant archaeological materials and/or burials with importance to Native Americans. Because the value of archaeological resources often depends on their integrity, project activities that disturb the resources could

render them insignificant. Project activities could also disturb burials. Therefore, this impact is considered significant and unavoidable.

No mitigation is available to reduce this impact to a less-than-significant level because the sites contain values (i.e., human remains important to Native Americans) that are not amenable to mitigation through data recovery. Mitigation measures are available that would recover or protect some of the cultural values that would be lost as a result of project implementation. Implementing Mitigation Measures M-10 through M-14 would reduce Impact M-8, but not to a less-than-significant level.

Mitigation Measure M-10: Prepare an HPMP and Conduct Data Recovery Excavations (Only Appropriate for CA-CCo-147) for Archaeological Materials on Holland Tract. Prior to implementation of Alternative 3, the project applicant shall prepare an HPMP that will outline how significant archaeological materials should be treated. The HPMP will require that a data recovery plan be prepared that specifies how important archaeological data will be recovered from CA-CCo-147. Data recovery could include removal of burials.

Mitigation Measure M-11: Cap Archaeological Sites on Holland Tract. Where appropriate, prior to implementation of Alternative 3, the project applicant shall cap archaeological sites to protect sites from pot hunting and vandalism.

Mitigation Measure M-12: Construct Fencing or Other Barriers to Prevent Site Access on Holland Tract. Where appropriate, prior to implementation of Alternative 3, the project applicant shall construct fences or other barriers to restrict access to archaeological sites and help protect sites from pot hunting and vandalism.

Mitigation Measure M-13: Construct Levees or Beach Slopes around Archaeological Sites to Decrease Wave Action and Erosion on Holland Tract. Where appropriate, prior to implementation of Alternative 3, the project applicant shall construct levees or beach slopes around sites to reduce the potential for wave action and erosion.

Mitigation Measure M-14: Prepare an HPMP to Provide for the Long-Term Monitoring of Known Archaeological Sites on Holland Tract. Prior to implementation of Alternative 3, the project applicant shall prepare an HPMP that includes a monitoring plan to identify impacts on intact burials that could result from inundation, wave action and erosion, and vandalism. The

HPMP will address treatment of intact burials in known sites that are inadvertently discovered during project construction and implementation. The HPMP will include notification procedures to be followed when intact burials are identified and will outline treatment and management requirements for human remains, should they be discovered. Treatment could include removing the burials from the site and reburial elsewhere.

Impact M-9: Disturbance of Buried Resources (If Present) in the Archaeologically Sensitive Piper Sands on Holland Tract. Piper sands on Holland Tract could contain buried resources. Inundation, wave action and erosion, and vandalism could uncover previously undiscovered resources on Holland Tract. Because the value of archaeological resources often depends on their integrity, activities associated with implementation of Alternative 3 that disturb buried resources could render them insignificant. If significant buried resources are present and they are disturbed by the project, such disturbance would be considered a significant impact. Implementing Mitigation Measure M-4 would reduce Impact M-9 to a less-than-significant level.

Mitigation Measure M-4: Prepare an HPMP to Provide for the Long-Term Monitoring and Treatment of Archaeologically Sensitive Areas on Holland Tract. This mitigation measure is described above under "Impacts and Mitigation Measures of Alternative 1".

Impact M-10: Disturbance of Unknown Resources on Unsurveyed Portions of Holland Tract. Approximately 100 acres of Piper sand mounds have not been surveyed because they are not owned or under the control of the project applicant, and the current owner did not permit the area to be surveyed. Ground-disturbing activities, inundation, wave action and erosion, and vandalism associated with implementation of Alternative 3 could uncover previously undiscovered resources on Holland Tract. Because the value of archaeological resources often depends on their integrity, project activities that disturb buried resources could render them insignificant. If significant buried resources are present and they are disturbed by the project, such disturbance would be considered a significant impact. Implementing Mitigation Measure M-15 would reduce Impact M-10 to a less-than-significant level.

Mitigation Measure M-15: Survey Unsurveyed Portions of Holland Tract and Determine Eligibility for NRHP Listing and Appropriate Treatment. Prior to implementation of Alternative 3, the project applicant shall survey the unsurveyed portions of Holland Tract to identify potentially significant cultural

resources. If potentially significant cultural resources are identified, their significance and appropriate treatment will be determined in accordance with the stipulations of the PA. If significant resources are identified during the survey, mitigation measures similar to those specified for the known resources would be implemented.

Historic-Period Resources

Bacon Island

The effect of implementation of Alternative 3 on historic-period resources on Bacon Island would be identical to that described above under "Impacts and Mitigation Measures of Alternative 1".

Webb Tract

As described above under "Impacts and Mitigation Measures of Alternative 1", no historic-period resources eligible for NRHP listing exist on Webb Tract; therefore, no impacts are anticipated.

Bouldin Island

The effect of implementation of Alternative 3 on historic-period resources on Bouldin Island would be identical to that described above under "Impacts and Mitigation Measures of Alternative 1".

Holland Tract

As described above under "Impacts and Mitigation Measures of Alternative 1", no historic-period resources eligible for NRHP listing exist on Holland Tract; therefore, no impacts are anticipated.

Summary of Project Impacts and Recommended Mitigation Measures

Impact M-11: Demolition of the NRHP-Eligible Historic District on Bacon Island. This impact is described above under Impact M-5. This impact is considered significant and unavoidable. Implementing Mitigation Measures M-5 through M-8 would reduce Impact M-11, but not to a less-than-significant level. These mitigation measures are described above under "Impacts and Mitigation Measures of Alternative 1".

Mitigation Measure M-5: Prepare an HPMP and a Data Recovery Plan for Archaeological Deposits on Bacon Island.

Mitigation Measure M-6: Prepare a Videotape of Public Broadcasting System Quality of the NRHP-Eligible Historic District on Bacon Island.

Mitigation Measure M-7: Prepare a Popular Publication on Bacon Island Resources for Use by Museums, Cultural Centers, and Schools.

Mitigation Measure M-8: Complete Historic American Building Survey/Historic American Engineering Record Forms, Including Photographic Documentation, That Preserve Information about the NRHP-Eligible District on Bacon Island.

Impact M-12: Disturbance of Archaeological Site CA-SJo-208H on Bouldin Island. This impact is described above under Impact M-6. This impact is considered significant. Implementing Mitigation Measure M-9 would reduce Impact M-12 to a less-than-significant level.

Mitigation Measure M-9: Prepare an HPMP and a Data Recovery Plan for Archaeological Deposits on Bouldin Island. This mitigation measure is described above under "Impacts and Mitigation Measures of Alternative 1".

IMPACTS AND MITIGATION MEASURES OF THE NO-PROJECT ALTERNATIVE

The shift from current agricultural practices to more intensive agriculture on the DW project islands under the No-Project Alternative would barely alter existing conditions. On Bacon and Bouldin Islands and Webb Tract, changing crop types and weed management practices would have little effect on cultural resources. On Holland Tract, any intensification of activities that affected Piper soils could increase the extent and severity of disturbance of prehistoric resources. Reintroduction of hog feeding could affect the Piper sand mounds if animals are concentrated in those areas.

If the DW project does not proceed, cultural resources on the islands would nonetheless be disturbed, primarily by continued agricultural activity. Activities that would continue to affect the resources include grazing, plowing and planting, and levee construction and replenishment. The following describes the impacts that

would result from implementation of the No-Project Alternative.

The project applicant would not be required to implement mitigation measures if the No-Project Alternative were selected by the lead agencies. However, mitigation measures are presented for impacts of the No-Project Alternative to provide information to the reviewing agencies regarding the measures that would reduce impacts if the project applicant implemented a project that required no federal or state agency approvals. This information would allow the reviewing agencies to make a more realistic comparison of the DW project alternatives, including implementation of recommended mitigation measures, with the No-Project Alternative.

Under strictly agricultural operations, mitigation of impacts on cultural resources would not be required under Section 106 of the NHPA, which applies only if federal funds or permits are required by a project. With the discovery of Native American burials on the Holland Tract sites, however, the California Public Health and Safety Code and the Public Resources Code apply, and the NAHC has the right to request appropriate reinterment of the remains. If agreement between the landowner and the NAHC cannot be reached, the landowner is nonetheless required to reinter the human remains and items associated with Native American burials with appropriate dignity on the property in a location not subject to further subsurface disturbance. Any disturbance or removal of human remains without authority of law is a felony under the California Public Health and Safety Code.

Prehistoric Resources

Bacon Island

As described above under "Impacts and Mitigation Measures of Alternative 1", no prehistoric resources eligible for NRHP listing exist on Bacon Island; therefore, no impacts are anticipated.

Webb Tract

No prehistoric resources eligible for NRHP listing have been identified on Webb Tract; however, 335 acres of Piper sands that could contain buried resources are present on the tract. In addition, burials have reportedly been uncovered on Webb Tract in the past.

Bouldin Island

As described above under "Impacts and Mitigation Measures of Alternative 1", no prehistoric resources eligible for NRHP listing exist on Bouldin Island; therefore, no impacts are anticipated.

Holland Tract

Three prehistoric archaeological sites (CA-CCo-147, CA-CCo-593, and CA-CCo-678) on Holland Tract are eligible for NRHP listing under Criterion D or have other values that make them significant. CA-CCo-147 and CA-CCo-678 contain intact human remains. No intact burials were found at CA-CCo-593; however, their presence cannot be ruled out, given the amount of disarticulated skeletal materials observed during the survey and test excavation.

Of the three sites, only CA-CCo-147 appears to retain a substantial archaeological deposit. CA-CCo-593 is shallow and disturbed. If CA-CCo-678 had a cultural deposit, most of it was removed during leveling of the mound. Piper sands on Holland Tract could contain buried resources. If buried resources are present, activities associated with implementation of the No-Project Alternative would adversely affect those resources.

Approximately 100 acres of Piper sand mounds have not been surveyed because they are not owned or under the control of the project applicant, and the current owner did not permit the area to be surveyed. Additional significant resources could be present on this parcel.

Summary of Project Impacts and Recommended Mitigation Measures

Disturbance of Buried Resources (If Present) in the Archaeologically Sensitive Piper Sands on Webb Tract as a Result of Agricultural Activities. No prehistoric resources eligible for NRHP listing have been identified on Webb Tract; however, approximately 335 acres of Piper sands on Webb Tract could contain significant buried resources. Because the value of archaeological resources often depends on their integrity, continued agricultural activities under the No-Project Alternative that disturb buried resources could render them insignificant. Implementing the following measure would reduce this effect of the No-Project Alternative.

Prepare an HPMP to Provide for the Long-Term Monitoring and Treatment of Archaeologically Sensitive Areas on Webb Tract. This measure is described above as Mitigation Measure M-1.

Damage to Known and Unknown Prehistoric Sites Resulting from Agricultural Activities on Holland Tract. There are three significant known prehistoric cultural resources on Holland Tract that would be disturbed by continued agricultural activities under the No-Project Alternative. The proximity of site CA-CCo-147 to corrals and salt blocks results in heavy use by cattle, leading to disturbance of the site. Plowing of CA-CCo-678 and CA-CCo-593 has exposed cultural materials and would continue to disturb the sites and possibly uncover human remains. Activities that have rendered CA-CCo-594 ineligible for listing in the NRHP (i.e., sand extraction) could further adversely affect CA-CCo-678, -147, and -593.

Additionally, Piper sands on Holland Tract could contain buried resources. If buried resources are present, continued agricultural activities could adversely affect those resources.

The integrity of the sand mounds that are known to contain or that potentially contain Native American burials and artifacts is threatened by the continued use by cattle and sand extraction. Continued deflation of peat soils caused by agricultural operations would increase the exposure of the Piper sand mounds, thereby increasing the potential for erosion of the margins, especially when combined with trampling by cattle. Implementing the following measure would reduce this effect of the No-Project Alternative.

Prepare an HPMP to Provide for the Long-Term Monitoring of Known and Unknown Archaeological Sites on Holland Tract. If the No-Project Alternative is selected, the project applicant should prepare an HPMP that includes a monitoring plan to identify impacts on intact burials that could result from agricultural activities, such as plowing, grazing, and sand extraction. The HPMP would address treatment of intact burials that are inadvertently discovered in known sites during agricultural activities. The HPMP would include notification procedures to be followed when intact burials are identified, and would outline treatment and management requirements for human remains, should they be discovered. Treatment could include removing the burials from the site and reburying them elsewhere.

Historic-Period Resources

Bacon Island

As described above under "Impacts and Mitigation Measures of Alternative 1", PAR has suggested that resources on Bacon Island are eligible for NRHP listing as a historic district. The majority of NRHA-eligible resources on Bacon Island will be affected by the continued deterioration of structures, modifications that are not consistent with their historic character, and possible demolition.

Webb Tract

As described above under "Impacts and Mitigation Measures of Alternative 1", no historic-period resources eligible for NRHP listing exist on Webb Tract; therefore, no impacts are anticipated.

Bouldin Island

PAR suggested that one historic archaeological site (CA-SJo-208H) on Bouldin Island is eligible for listing in the NRHP under Criterion D. This site will not be affected by continued agricultural activities.

Holland Tract

As described above under "Impacts and Mitigation Measures of Alternative 1", no historic-period resources eligible for NRHP listing exist on Holland Tract; therefore, no impacts are anticipated.

Summary of Project Impacts and Recommended Mitigation Measures

Damage to Historic Structures Resulting from Agricultural Practices on Bacon Island. Under the No-Project Alternative, an indirect effect of agriculture on cultural resources results from the use of historic structures as boarding houses. Normal wear and tear and modification of the structures without concern for their historic integrity could reduce their significance. Continued use of the structures in this manner probably would result in a need for replacement, perhaps accompanied by demolition of the historic structures. Occupation of the historic structures provides some protection because they are less vulnerable to vandalism. Implement-

ing the following measure would reduce this effect of the No-Project Alternative.

Prepare an HPMP to Provide for the Long-Term Maintenance and Protection of Historic Properties on Bacon Island. If the No-Project Alternative is selected, the project applicant should prepare an HPMP addressing the effects of continued agricultural use on the historic structures on Bacon Island.

CUMULATIVE IMPACTS

Cumulative impacts are the result of the incremental impacts of the proposed action when added to other past, present, and reasonably foreseeable future actions. The following discussion considers only those impacts that may contribute cumulatively to impacts on cultural resources in the vicinity of the DW project islands.

Cumulative Impacts, Including Impacts of Alternative 1

Prehistoric Resources

Impact M-13: Destruction of or Damage to Prehistoric Archaeological Sites in the Delta. Fourteen prehistoric sites have been found near the DW project site. Many of these have been adversely affected by agricultural activities, leveling, and sand extraction occurring in the Delta. The effects of the DW project would not contribute to the overall loss of prehistoric resources in the Delta because the single prehistoric archaeological site within the APE for the DW project is not eligible for listing in the NRHP. This impact is considered less than significant.

Mitigation. No mitigation is required.

Historic-Period Resources

Impact M-14: Destruction of or Damage to the NRHP-Eligible Historic Districts Representing Agricultural Labor Camp Systems in the Delta. During the last 25 years, the majority of agricultural labor camps in the Delta have been demolished or modified or have deteriorated. The resources on Bacon Island represent one of the last intact agricultural labor camp systems in the Delta. The destruction of the resources on Bacon Island that are eligible for NRHP listing as a historic district would add to the loss of this historic resource type

in the Delta. This impact is considered significant and unavoidable. Implementing Mitigation Measures M-5 through M-8 would reduce Impact M-14, but not to a less-than-significant level. These mitigation measures are described above under "Impacts and Mitigation Measures of Alternative 1".

Mitigation Measure M-5: Prepare an HPMP and a Data Recovery Plan for Archaeological Deposits on Bacon Island.

Mitigation Measure M-6: Prepare a Videotape of Public Broadcasting System Quality of the NRHP-Eligible Historic District on Bacon Island.

Mitigation Measure M-7: Prepare a Popular Publication on Bacon Island Resources for Use by Museums, Cultural Centers, and Schools.

Mitigation Measure M-8: Complete Historic American Building Survey/Historic American Engineering Record Forms, Including Photographic Documentation, That Preserve Information about the NRHP-Eligible District on Bacon Island.

Cumulative Impacts, Including Impacts of Alternative 2

The cumulative impacts of Alternative 2 are the same as those of Alternative 1.

Cumulative Impacts, Including Impacts of Alternative 3

Prehistoric Resources

Impact M-15: Destruction of or Damage to Prehistoric Archaeological Sites in the Delta. Fourteen prehistoric sites have been found near the DW project site. Many of these have been adversely affected by agricultural activities, leveling, and sand extraction occurring in the Delta. The effects of the DW project would contribute to the overall loss of prehistoric resources in the Delta. Because implementing Alternative 3 would result in significant and unavoidable effects on prehistoric resources on Holland Tract, this cumulative impact is considered significant and unavoidable.

Although no mitigation to reduce this impact to a less-than-significant level exists, implementing the following mitigation measures will reduce the magnitude of

this cumulative impact. These mitigation measures are described above under "Impacts and Mitigation Measures of Alternative 1" and "Impacts and Mitigation Measures of Alternative 3".

Mitigation Measure M-4: Prepare an HPMP to Provide for the Long-Term Monitoring and Treatment of Archaeologically Sensitive Areas on Holland Tract.

Mitigation Measure M-11: Cap Archaeological Sites on Holland Tract.

Mitigation Measure M-12: Construct Fencing or Other Barriers to Prevent Site Access on Holland Tract.

Mitigation Measure M-13: Construct Levees or Beach Slopes around Archaeological Sites to Decrease Wave Action and Erosion on Holland Tract.

Mitigation Measure M-14: Prepare an HPMP to Provide for the Long-Term Monitoring of Known Archaeological Sites on Holland Tract.

Mitigation Measure M-15: Survey Unsurveyed Portions of Holland Tract and Determine Eligibility for NRHP Listing and Appropriate Treatment.

Historic-Period Resources

Impact M-16: Destruction of or Damage to the NRHP-Eligible Historic Districts Representing Agricultural Labor Camp Systems in the Delta. This cumulative impact is described above under Impact M-14. This impact is considered significant and unavoidable. Implementing Mitigation Measures M-5 through M-8 would reduce Impact M-16, but not to a less-than-significant level. These mitigation measures are described above under "Impacts and Mitigation Measures of Alternative 1".

Mitigation Measure M-5: Prepare an HPMP and a Data Recovery Plan for Archaeological Deposits on Bacon Island.

Mitigation Measure M-6: Prepare a Videotape of Public Broadcasting System Quality of the NRHP-Eligible Historic District on Bacon Island.

Mitigation Measure M-7: Prepare a Popular Publication on Bacon Island Resources for Use by Museums, Cultural Centers, and Schools.

Mitigation Measure M-8: Complete Historic American Building Survey/Historic American Engineering Record Forms, Including Photographic Documentation, That Preserve Information about the NRHP-Eligible District on Bacon Island.

Cumulative Impacts, Including Impacts of the No-Project Alternative

Destruction of or Damage to Prehistoric Archaeological Sites and Historic Resources in the Delta. Direct effects of the No-Project Alternative contribute to the cumulative destruction of or damage to prehistoric archaeological sites and historic resources in the Delta. Under the No-Project Alternative, known and unknown prehistoric resources on the DW project islands would continue to be disturbed by agricultural activities, including grazing, plowing, and planting. Additionally, use of historic structures as boarding houses or for other agricultural support activities could increase wear and tear on the structures. Implementing the following measures would reduce this cumulative effect. These measures are described above under "Impacts and Mitigation Measures of the No-Project Alternative".

Prepare an HPMP to Provide for the Long-Term Monitoring and Treatment of Archaeologically Sensitive areas on Webb Tract.

Prepare an HPMP to Provide for the Long-Term Monitoring of Known and Unknown Archaeological Sites on Holland Tract.

Prepare an HPMP to Provide for the Long-Term Maintenance and Protection of Historic Properties on Bacon Island.

CITATIONS

References to the Code of Federal Regulations (CFR) are not included in this list. CFR citations in text refer to title and section (e.g., 36 CFR 60.6 refers to Title 36 of the CFR, Section 60.6).

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Personal Communications

Maniery, M. President. PAR Environmental Services, Inc., Sacramento, CA. January 19, 1993 - telephone conversation regarding possible prehistoric resources discovered during farming of Webb Tract.